Although the existing wastewater collection systems are not adequate for regional wastewater transmission, they could be used to provide source collection and transmission to a regional collection system. The following components of wastewater treatment had to be evaluated in the process of developing a wastewater master plan for Monroe County and incorporated municipalities.

2.4.1.1 Collection Systems

The three wastewater collection technologies identified by the various master plans as best suited for use in the study area were centrifugal grinder pump systems, progressive cavity grinder pump systems and vacuum sewers. All three technologies are capable of providing reliable wastewater service, if properly installed and maintained. Gravity sewers would also provide reliable service, but at a significantly higher cost than the alternative collection systems. Based on cost estimates prepared for the four collection system options, vacuum sewers were identified as the lowest cost collection sytem alternative.

Of the three preferred alternative wastewater collection systems, vacuum systems have a clear advantage with respect to system reliability. Vacuum sewers do not require a power source at individual connection points and the system can remain in service during a power outage if auxiliary power is provided at the vacuum stations. Maintenance costs for the four wastewater collection system options are similar. Owners and operators of existing systems reported similar frequencies of maintenance calls for the two types of grinder pump stations and the vacuum valves. On the average, repairs to vacuum valves were reported to be less costly than repairs to grinder pump station.

2.4.1.2 Effluent Disposal Methods

Requirements for effluent disposal in Monroe County were amended by the 1999 Florida Legislature, prohibiting new or increased discharges into surface waters and mandating the elimination of existing discharges to surface waters by July 1, 2006. While this legislation allows effluent reuse systems, but otherwise requires the use of underground injection for effluent disposal, under the following conditions:

- *Shallow Injection Wells* - If the design capacity of the facility is less than 1 million gallons per day (mgd), the injection well must be at least 90 feet deep and cased to a minimum depth of 60 feet (this is considered a shallow injection well).
- *Deep Injection Wells* - If the design capacity of the facility is equal to or greater than 1 mgd, the injection well must be cased to a minimum depth of 2100 feet (a deep injection well).
- *Water Reuse* – The Monroe County Master Plan recommended limited use or reliance on effluent reuse. Among the drawbacks sited for effluent reuse is that land application requires full storage or backup disposal systems whenever treatment requirements are not achieved, or when the land application site cannot accept reclaimed effluent, including extended periods of wet weather. Additionally, relatively large tracts of land are required to accommodate the effluent being

disposed. Such tracts may be distant from the plant site, causing high transmission conveyance costs.

Potentially feasible effluent management alternatives were identified and subjected to a preliminary screening. Those alternatives that contained major obstacles to implementation were eliminated from further consideration. The alternatives that passed the preliminary screening were evaluated further. Upon completion of the in-depth evaluation, the remaining effluent management alternatives were either eliminated from further consideration or incorporated into the Facilities Plan. Reuse by land application, underground injection through deep wells, underground injection through shallow wells, and surface water disposal were identified as potentially feasible methods for effluent management in the Marathon area.

Recommendation: A total of four scenarios were considered:

It should be noted that order of magnitude costs are reported herein. These are considered planning level costs, and their "accuracy" should be in the range of plus or minus 30%. Also costs may not be all inclusive, and are provided as a frame of reference for the various alternatives.

Scenario No. 1 – WWTP Capacity of 0.02 mgd. FDEP does not allow reuse for systems this small. A shallow injection well system is the only remaining feasible alternative for effluent management. The order-of-magnitude construction cost estimate for this system is $33,000 for two wells, wellfield piping, and polishing tank only.

Scenario No. 2 – WWTP Capacity of 0.1 mgd. It was recommended that the primary effluent management system be a shallow injection wellfield system. The order-of-magnitude construction cost estimate for the shallow injection wellfield, including four wells, piping effluent, and polishing, is $100,000.

Reuse should be pursued as the secondary effluent management method. 0.1 mgd is the minimum allowable size for a reuse system. The order-of-magnitude cost estimate for the reuse system is approximately $1 million for WWTP filters, disinfection, effluent storage tank, continuous on-line turbidity and chlorine residual monitoring equipment, and high service pumping. This cost does not include transmission and distribution piping and connection to the existing irrigation systems. These offsite costs will be determined when site-specific areas for reuse are defined and can be expected to add substantially to the cost of the reuse alternative.

Scenario No. 3 – WWTP Capacity of 1.0 mgd. As with Scenario No. 2 above, a shallow injection wellfield system is recommended for the primary effluent management system. The order-of-magnitude construction cost for the shallow injection well system, including 14 wells is $750,000.

Reuse should be pursued as the secondary method of effluent management, depending on economic feasibility. The order-of-magnitude construction cost estimated for the filters, disinfection, effluent storage tank, continuous on-line turbidity and chlorine residual monitoring equipment, and high service pump station is approximately $2.5 million. Again, offsite facilities, to be evaluated later in the Facilities Plan, will add substantially to the cost of the entire reuse system.

Scenario No. 4 – WWTP Capacity of 2.0 mgd. A deep injection well system was recommended as the primary effluent management system. Two injection zones exist that are suitable for wastewater disposal were identified. These constitute the upper part of the Floridian Aquifer System (FAS); these are an intermediate-depth zone, extending from 2,100 to 2,500 feet below the surface.

Preliminary design indicates that a 12-inch diameter steel casing set to a depth of approximately 650 feet bls will convey effluent to the injection horizon. The well will be completed with open-hole construction from 650 to 1,200 feet bls.

Typical surface facilities will include a pump station, surge control system, yard piping, and instrumentation. A second, redundant intermediate depth injection well would provide a back-up system for periods in which the primary injection well is off-line for testing. An order-of-magnitude construction cost for two intermediate-depth injection wells and surface facilities is approximately $1.52 million, with an annual O&M cost of approximately $90,000.

If the intermediate-depth deep well described above could not be permitted, another potential injection zone exists at 2,100 to 2,500 feet bls, commonly known as the Boulder Zone. This injection horizon is most likely confined by dense limestone from 1,200 to 2,100 feet bls. This option would include a 22-inch casing set to 650 feet bls, and a 12-inch-diameter casing set to 2,100 feet bls, with open-hole construction to 2,500 feet bls. The estimated order-of-magnitude construction costs for two deep wells and surface facilities is $2.82 million, with an annual O&M cost estimated to be $90,000.

Reuse should be pursued as the secondary effluent management method, if economically feasible. The order-of-magnitude estimate of the construction cost for reuse facilities at the WWTP site is approximately $3.5 million.

2.4.1.3 Solids Waste Management

Alternatives for processing and disposing of residual wastewater solids (treatment plant sludge and septage) that would be generated in the study area upon implementation of regional or subregional wastewater collection and treatment systems were evaluated. The alternatives evaluated included various processes for stabilizing, dewatering, transporting, and disposing of solids produced by two WWTPs serving the primary and secondary service areas. Alternative means of handling treatment plant solids and septage from the remaining areas of the planning area were evaluated.

Proven solids handling processes in general use in the United States today were first screened with respect to their applicability at a new regional WWTP serving the primary service area. For the wastewater collection/treatment option utilizing subregional WWTPs, it was assumed that a single centralized solids handling facility would be constructed at one WWTP site, and solids from the other WWTPs would be transferred to that site for processing. The most feasible processes were then formulated into alternative systems, which were compared on the basis of both capital and O&M costs.

2.4.1.4 Wastewater Management Alternatives

The wastewater management alternatives were evaluated to identify the most cost-effective and environmentally favorable plan for wastewater management. The alternatives consisted of:

- Upgrade individual onsite systems with Best Available Technology (BAT) and upgrade existing package plants to Advanced Wastewater Treatment (AWT) standards.
- Serve the primary service area with subregional WWTPs.
- Serve the primary service area with a regional WWTP.

All regional management alternatives were evaluated on the basis of providing AWT where treatment plant flows were greater than 100,000 gpd in accordance with the Monroe County Board of County Commissioner's (BCC's) selection of AWT as the most environmentally sound treatment level. Alternatives were evaluated on the basis of cost and environmental and implementation factors.

Approximately 23,000 private onsite systems and approximately 246 small wastewater treatment plants are currently operating throughout the Florida Keys. The onsite systems are comprised of approximately 15,200 septic systems, 640 ATUs, and 7200 unknown systems. As previously stated, approximately 2,800 of the 7,200 unknown systems are suspected to be illegal cesspools. The Monroe County Master Plan estimated that the onsite systems contribute 4.88 mgd of wastewater and the WWTPs contribute 2.4 mgd of wastewater. Each of these onsite systems and treatment plants provide minimal nutrient removal with effluent from all facilities containing nutrient levels of about 20 milligrams per liter (mg/l) of total nitrogen (TN) and 5 mg/l of total phosphorous. The onsite systems primarily serve single family residences and small commercial establishments, while the small WWTPs serve condominium and apartment complexes, resorts, motels, restaurants and other larger commercial establishments where higher volumes of wastewater are generated.

2.4.1.5 Wastewater Reuse

Although there are advantages associated with wastewater reuse, the high cost associated with additional facilities and the limited availability of suitable areas to irrigate make this option more difficult to implement in the Florida Keys than in other areas of Florida. An

immediate initial step in determining the practicality and economics of wastewater reuse in the Keys should be to conduct reuse feasibility studies throughout the different service areas. These studies should establish firm amounts of reclaimed water to which reuse customers are willing to commit and pay.

2.4.2 Stormwater Systems

According to the Monroe County Stormwater Management Master Plan and the information provided by the Municipalities which have prepared Master Plans, historical reports, staff input and public comments indicate that there are two types of stormwater concerns in the Florida Keys: water quality and nuisance flooding. A survey of citizens present at public meetings on the MCSMMP ranked a number of stormwater-related issues from most important to least important:

Table 2.1 Ranking by Citizens of Stormwater Related Issues

Issue	Rank
Water Quality Protection/Improvement	1
Development Controls	2
Enforcement of Existing Regulations	3
Flooding	4
Costs	5
Operation & Maintenance	6
Recreational Opportunities	7

Generally, the plan for addressing these concerns consists of developing a list of stormwater problem areas. The problem areas are then ranked using a criteria such as: flood severity, water quality benefits from improving the problem, expected growth of the study area, overall benefit (i.e., does the problem area affect many citizens?), and historical priority assigned. Many of the problem areas were investigated and found to be on private property.

Following the ranking, the projects are then analyzed versus a list of potential improvement alternatives and the best management practice (BMP) alternative for each problem area is selected. The alternatives generally considered in the Florida Keys include those discussed in the following section.

2.4.2.1 BMP Alternatives

The MCSMMP listed 19 structural BMPs and 16 nonstructural source controls considered in for the Florida Keys.

Structural BMPs

- Shallow grassed swales
- Retention basins

- Buffer strips
- Porous pavement
- Water quality inlets and baffle boxes
- Hydrodynamic separators
- Underdrains and stormwater filter systems
- Infiltration drainfield
- Dry Wells
- Modular treatment systems
- Stormwater wetlands
- Alum injection systems
- Aeration
- Level spreaders
- Oil/grease separators
- Recharge wells and bore holes with pretreatment

Based upon the climate of the Florida Keys, the topography and soils of the islands, and stormwater management experience of engineers within the Keys, the following structural BMPs are recommended for application for all types of land development:

- Buffer Strips Porous Pavement
- Water Quality Inlets
- Baffle Boxes Hydrodynamic Separators
- Dry Wells w/Pretreatment
- Modular Treatment Stormwater Wetlands
- Alum Injection
- Aeration Oil & Grease Separators
- Vegetated Swales

Of this list, it was recommended that hydrodynamic separators, baffle boxes, modular systems and alum injection be pilot tested prior to full-scale recommendation since there has been no experience with these BMPs within the Florida Keys.

Nonstructural Stormwater Controls

- Land use planning
- Public information programs
- Stormwater management ordinance requirements
- Fertilizer application controls
- Pesticide use controls
- Control of gray water (Cisterns and Rainbarrels)
- Solid waste management
- Hazardous materials management
- Street sweeping
- Vehicle use reduction
- Directly connected impervious area (DCIA) minimization
- Low impact development

- Illicit connections (non-stormwater discharges) identification and removal
- Erosion and sediment control on construction sites
- Source control on construction sites
- Operation and maintenance

For non-structural or source controls all of the BMPs on the list are recommended except for street sweeping. While street sweeping can be effective in some urban environments, a curb and gutter road system is generally needed (non-vacuum system) and most of the Keys do not have such roads. Recommended source controls include:

- Land Use Planning
- Public Information
- Ordinance Requirements
- Cisterns/Rainbarrels
- Vehicle Use Reduction
- Impervious Reduction
- Low Impact Development
- Erosion/Sediment Control
- Operation & Maintenance

2.4.2.2 Special Considerations for Bridges

The study lists the islands along US1 within the Monroe County study area with the approximate lengths and bridges connecting them (lengths given to the nearest 0.1 mile). It can be seen that, of the 107 miles indicated, 18.9 miles (about 18 percent) of US1 are bridges of various lengths.

Related to stormwater runoff, a bridge is 100 percent impervious and rain that falls on the bridge either runs off directly to the near shore waters under the bridge or flows down the bridge to the entrance or exit. The question, of whether or not runoff directly from the bridge can be treated efficiently and at a reasonable cost was studied in the MCSMMP and it was concluded that bridge runoff control is not recommended on a large scale. However, it was suggested that bridge runoff treatment should be tried at one or more sites for a few years, with monitoring to confirm treatment efficiencies. Depending on the outcome, bridge runoff control could be implemented on selective bridges.

2.5 Public Involvement / Outreach

An extensive public involvement program for the Monroe County Sanitary Wastewater, Master Plan was implemented to allow key stakeholders and interested citizens of Monroe County with the opportunity to participate in, and influence, the outcome of the Master Plan. Interaction with the public throughout the development process significantly assisted in the development of the contents of the Master plan. Numerous public involvement efforts were implemented as part of the Master Plan development process, and they included:

- Public forums and workshops
- Meetings with civic, business, and environmental groups throughout the Florida Keys
- Preparation and distribution of project fact sheets and brochures
- Media coordination
- Production of two videos
- Development of a project web site

Interested citizens and key stakeholders directly influenced the development of the decision models and evaluation processes, identified key issues to be addressed, and defined the elements of what was believed to be an acceptable sanitary wastewater master plan. Throughout the process, citizens clearly stated that cost was the most critical issue to plan implementation. Secondly, there were concerns raised by stakeholders regarding the effectiveness and reliability of the selected wastewater treatment options. Finally, County residents demanded that issues related to potential "double-pay" be addressed

A Scoping Letter was issued to various stakeholders and interested parties on February 9, 2003 and comments were received through March 15, 2002. A public meeting was held in Marathon, FL on February 27, 2003 to elicit comments and determine issues to be addressed during the NEPA process. Significant issues that were identified during the scooping process and discussion with regulatory agencies, stakeholders, and residents of the Florida Keys fall into two general categories:

- Water quality degradation of the Sanctuary; and
- Economic equitability of program funding.

The primary issue associated with the proposed FKWQIP is degraded water quality in the Sanctuary that has resulted from inadequate treatment of wastewater and stormwater in the Keys.

3.0 PROGRAM COMPONENTS

3.1 Planning Process Summary

Several stormwater and wastewater master plans have been prepared for Monroe County and municipalities located within Monroe County. The Corps plans to utilize these decision-making documents as the foundation for the planning component of the Florida Keys Water Quality Improvements Program. Since 1994, the following plans and documents have been produced and were reviewed for inclusion in this PFM:

3.1.1 Wastewater

3.1.1.1 Monroe County Sanitary Wastewater Master Plan

This document is dated June 2000, and was prepared by CH2MHill, Inc. et al. The stated objective of this Master Plan was to "develop a plan that would provide an equitable, ecologically sound, and economical implementation strategy for managing wastewater and improving the water quality in the Florida Keys." The stated goal was to "provide responsive, flexible, and cost-effective solutions that improve wastewater management throughout the keys and satisfy existing and future needs of the community." Additionally, The Master Plan's goal was to address affordability and equity issues, and to satisfy environmental and regulatory criteria and guidelines. The planning and study area included the entire developed area of the Florida Keys, except for the Cities of Key West and Key Colony Beach (see Figure 1).

The recommendations presented in this master plan include:

- That existing onsite systems located in lower density areas of the Florida Keys be upgraded or replaced with an OWNRS
- Installation of 12 community wastewater collection and treatment systems
- Installation of 5 regional wastewater collection and treatment systems
- That 17 existing facilities continue to operate and upgrade their treatment processes to meet BAT or AWT, as required, by July 2010

The master plan further recommended that 5 of the 12 community wastewater collection and treatment systems feature interim wastewater treatment plants that, over time, be phased into the larger regional systems. Details of the recommendation from the Monroe County master plan for each of the three regions of the Florida Keys are presented below:

Lower Keys – In the Lower Keys, four new community wastewater systems and two new regional wastewater systems were recommended for construction. The two proposed regional systems in the Lower Keys are relatively small, in terms of both volume of flow and area, thus the first phase of these WWTPs can be constructed at the actual regional WWTP site. In addition to the new systems or extension of existing systems that are were discussed, the master plan recommended that seven existing facilities in the Lower Keys continue to operate and upgrade their treatment processes to meet the BAT/AWT standard by July 1, 2010.

Middle Keys – in the Middle Keys, two new community wastewater systems and one new regional system are recommended. The proposed Middle Keys service areas are shown on Figure 1. Other than Duck Key, Conch Key, and Long Key/Layton, all study areas of the Middle Keys will continue to operate and upgrade their treatment process to meet the BAT/AWT standard by July 1, 2010. These systems include:

- Hawk's Cay (Hawk's Cay portion of AWT upgrade)
- West End Long key (three facilities)
- East end Long Key (two facilities)

Upper Keys – In the Upper keys, one new community wastewater system is recommended in Lower Matecumbe, and two new regional systems are recommended: the 1.5 mgd system to serve Islamorada Regional Wastewater Management District; and a 2.25 mgd system to serve the Tavernier/Key Largo Regional Wastewater Management District.

3.1.1.2 Marathon Wastewater Facilities Plan

This document is dated April 1998, and was prepared by CH2MHill, Inc. et al. The purpose of this Plan was "to define the most cost-effective, environmentally sound, and implementable program for the management of existing and future wastewater pollutants that presently act, or will act, to deteriorate the Key's water quality in the Marathon area." The planning area encompasses the area from the Seven Mile Bridge through Conch Key (see Figure 1). The three steps that comprised the implementation of the wastewater management system were stated to be "planning, design, and construction." The scope of work for this Facilities Plan is defined in Construction Grants, 1985, a manual published by the Environmental Protection Agency (July 1984).

3.1.1.3 City of Key West Water Quality Improvement Program

This program, dated June 2001, was developed by the City of Key West in order to facilitate the City's commitment to "divert stormwater runoff away from Outstanding Florida Waters", eliminate potential sewer/stormwater conflicts and to reduce Infiltration and Inflow in their sewer system. This program contains both wastewater and stormwater projects.

3.1.1.4 City of Key Colony Beach Sewer System Evaluation

This document, dated September 2002, was prepared by URS Corporation. The City has "continuously expended funds" over the last five years in rehabilitating their existing wastewater collection system. The purpose of this report was to assist the City's wastewater system operation staff in identifying additional sources of Inflow and Infiltration in their wastewater system. Closed Circuit TV monitoring of the sewer lines was used to identify lines in need of repair. The report presented recommendations for

repair of the various sewer lines. Repair methodology included Slip Lining of cracked or broken sewer lines and re-grouting of a number of service connections.

3.1.1.5 City of Marathon Reuse Component Central Wastewater RFP

This document was prepared in May 2001, and revised in August 2001 and again in October 2001, by Calvin, Giordano & Associates, Inc. The purpose of this study was "to determine water reuse feasibility for the City of Marathon". The scope of this study was generally based on FDEP's *Guidelines for Preparation of Reuse Feasibility Studies for Applicants Having Responsibility for Wastewater Management.*

3.1.1.6 Design/Build/Operate Wastewater Management System for the City of Marathon, FL

This document prepared by the FKAA represents a set of specifications that accompanied a Request for Proposal (RFP) for the Design/Build/Operate Wastewater Management System (DBOWMS) for the City of Marathon, FL. The specifications establish certain minimum technical requirements and minimum level of quality for the treatment system to be constructed and operated for the City.

3.1.1.7 Federal Emergency Management Agency Programmatic Environmental Assessment

FEMA has received grant applications to fund the construction of several wastewater treatment systems in Monroe County. Much of the proposed project funding would be provided through FEMA 1249-DR post Disaster – Unmet Needs funds. Matching funds will be provided through the Florida Division of Emergency Management and local government applications. While the EA prepared in September of 2002 was programmatic in nature, it was written to address the environmental consequences of constructing four planned wastewater treatment projects.

3.1.2 Stormwater

3.1.2.1 Village of Islamorada Stormwater Management Master Plan

This document was prepared in September 2000 by Law Engineering and Environmental Services, Inc. The purpose of this plan was to "address water quality improvements to stormwater discharges into the Village's canals and near shore waters of the Atlantic Ocean and Florida Bay." The planning area was the entire Village, which spans from Mile Marker 90.94 to the north to 72.66 to the south and consists of four islands: Plantation Key, Windley Key, Upper Matecumbe Key and Lower Matecumbe Key (see Figure 1).

3.1.2.2 Monroe County Stormwater Management Master Plan

This document, dated August 2001, was prepared by Camp, Dresser & McKee, Inc. The stated purposes of the Stormwater Management Master Plan are to "assess the adequacy of existing systems, prioritize stormwater management needs for each island, identify regulations and policy needs, and develop a plan to finance the construction, operation and maintenance of required facilities.". The geographic area of this project consists of the islands in the County (the Florida Keys), which are traversed by US 1 (see Figure1).

3.1.2.3 City of Key West Stormwater Runoff Study

This document dated September 1994 was prepared by Kisinger, Campo and Associates Corp (KCA). The stated purpose of the study was to identify and map the existing flooding locations and ultimately develop a Drainage Improvement Development Plan.

3.1.2.4 City of Key West Long Range Stormwater Utility Plan

This plan, dated June, 2001 was prepared by the City's Engineering Services Division. The purpose of the plan was to document the studies previously prepared by KCA and CH2M Hill as well as information regarding flooding problems after 1994, and make recommendations as to required future projects and funding to alleviate flooding and improve water quality in and around the City of Key West.

3.1.3 Master Project List

As part of this program management plan, the plans or studies listed above were reviewed and the recommended list of improvement projects from each was extracted to be incorporated in the FKWQIP master project list. Information contained in this master list includes:

- The FKWQIP Project Number (simply a tracking number)
- Whether the project is a wastewater or stormwater project,
- The governmental or other entity supporting the project,
- The source of the data,
- The region of the Keys this project is in (i.e. Upper, Middle or Lower Keys),
- The service or study area name,
- Whether or not the project served a "Hot Spot" area,
- The project name, and wastewater service area if applicable,
- The "Hot Spot" area name it will serve if applicable,
- The project rank by region if available,
- The overall rank of the project based on each of the various master plans or studies,
- The proposed action or project description,
- The date the cost estimate for the project was published and the estimated cost,

- A updated cost for 2002 based on the Engineering News Records Construction Cost Index

After the list was prepared, it was distributed to the PDT, which contains members from each of the entities supporting the projects. The PDT members were asked to update the list as required and data for the following additional fields were made part of the master list:

- Results of project bidding if available,
- Tentative start and finish dates for each project,
- Current status and projected cost estimate of the project,
- Anticipated procurement method (e.g. Design-Bid-Build, Design-Build, Design-Build Operate),
- Anticipated Corps level of involvement (e.g. Construction Administration, Design, Construction Management),
- Current Funding Available,
- Funding Source,
- Readiness Score

The Master Project List, which can be found in Appendix F, contains nearly 260 wastewater and stormwater projects with a total estimated cost[1] of over $615 million. A summary of the Master Project List can be found in Table 3.1:

Table 3.1 Summary of Master Project List

	Wastewater Projects		**Stormwater Projects**		**Total Water Quality Improvement Projects**	
	Number	Estimated Cost[1]	Number	Estimated Cost[1]	Number	Estimated Cost[1]
Monroe County	34	$ 165,663,213	22	$ 6,332,641	56	$ 165,280,816
Village of Islamorada	7	$ 107,455,090	63	$ 52,069,268	70	$ 132,443,981
City of Key West	8	$ 20,671,000	99	$ 17,404,567	107	$ 38,075,567
City of Key Colony Beach	1	$ 335,000	0	$ -	1	$ 335,000
Key Largo Wastewater Board	14	$ 139,693,435	0	$ -	14	$ 130,001,711
City of Layton	1	$ 4,650,000	0	$ -	1	$ 4,650,000
City of Marathon	7	$ 101,634,979	0	$ -	7	$ 142,233,606
Totals	**72**	**$ 540,102,717**	**184**	**$ 75,806,477**	**256**	**$ 615,909,194**

[1] These costs are based solely on information provided in each of the respective plans or studies and have been updated based on information provided by the various PDT members or based on the ENRCCI

3.2 Prioritization Rationale

In implementing the FKWQIP authorizing legislation stated, "In selecting projects under subsection (a), the Secretary shall consider whether a project will have substantial water quality benefits relative to other projects under consideration." This is precisely what was accomplished by the various Wastewater and Stormwater Master Plans prepared for the County and Municipalities in the Florida Keys and amended by the PDT.

3.2.1 Water Quality "Hot Spots"

In July of 1992, the USEPA Oceans and Coastal Protection Divisions produced a report entitled "Water Quality Protection Program for the Florida Keys National Marine Sanctuary; Phase 1 Report". The report provided a list of 84 water quality "Hot Spots". These are areas with, based upon workshops and discussion groups, known or suspected water quality degradation. The list of 84 was later refined to a list of 88 "Hot Spots" according to a meeting summary dated March 19, 1996. This report list was mainly related to water quality issues associated with wastewater influences. In July of 1999, Monroe County produced " Water Quality 'Hot Spots' in the Florida Keys: Evaluations for Stormwater Contributions". This report assessed the previously identified concerns, visited the areas in the field, and defined the most probable stormwater-influenced problem areas.

3.2.2 Wastewater Project Prioritization

3.2.2.1 Monroe County Sanitary Wastewater Master Plan

Given the MCSWMP's goal of eliminating unknown systems, and cesspools, other parameters, such as annual cost per pound of nitrogen or phosphorous removed, while important, were deemed to be secondary in importance to the goal of eliminating cesspools. Consequently the parameter of annual cost per unknown system eliminated was the principle criteria used for determining the extent of a community wastewater collection and treatment system, and for establishing and ranking Water Quality "Hot Spot" areas.

Table 3-2 lists the ranked "Hot Spots", and includes "Hot Spots" for the entire wastewater master plan study area. The rankings are shown for the entire Keys, with a ranking of 1 for the "Hot Spot" areas that the MCSWMP recommended be addressed first as well as for each region of the Florida Keys, regardless of political boundaries. Generally, "Hot Spot" areas encompass two or more subdivisions and adjacent areas. As indicated above, the Monroe County Ordinance dealing with elimination of cesspools required that each area of the Keys (Upper, Middle, Lower) establish priority "Hot Spots" and initiate planning, design, an construction of these community wastewater systems.

3.2.2.2 Marathon Wastewater Facilities Plan

They Marathon Wastewater Facilities Plan used a project prioritization rational similar to that used in the Monroe County Sanitary Wastewater Master Plan.

3.2.2.3 City of Key West Water Quality Improvement Program

Prioritization rational used in developing this program was not available.

3.2.2.4 City of Key Colony Beach Sewer System Evaluation

The evaluated the recommended rehabilitation projects based on the severity of the deterioration of the sewer collection or transmission segment. They then combined all of the repairs recommended in the Sewer System Evaluation into one project.

3.2.2.5 City of Marathon Reuse Component Central Wastewater RFP

No specific projects were identified as part of this study.

3.2.2.6 Design/Build/Operate Wastewater Management System for the City of Marathon, FL

This document pertained to only one project. The project was one of those developed in both the Monroe County Sanitary Wastewater Master Plan and the Marathon Wastewater Facilities Plan.

3.2.2.7 Federal Emergency Management Agency Programmatic Environmental Assessment

The purpose of this document was to provide a programmatic level environmental assessment for three projects previously identified in the MCSWMP, and as such, no project prioritization was considered other than that previously performed in the Master Plan.

3.2.3 Stormwater Project Prioritization

With regard to stormwater, each master plan prioritized project areas based on criteria similar to that indicated in section 2.4.2, which listed the highest priority concern as water quality protection/improvement.

3.2.4 Allocation of Program Funds

3.2.4.1 Intergovernmental Task Force

The Intergovernmental Task Force (ITF) in Monroe County is an organization with representatives from each of the Municipal Governments of the Florida Keys. The general purpose of this group is to provide a common voice to ensure that progress is made on water quality issues in the Florida Keys.

3.2.5 Readiness to Proceed Criteria

The Readiness to Proceed Criteria dated June 22, 2001 was prepared by the FKAA, Florida Department of Community Affairs and the Florida Department of Environmental Protection to "define when a recipient is eligible to receive a percentage of their share of

any federal/state appropriation for wastewater and stormwater improvements authorized under the Florida Keys Water Quality Improvement Act.

According to the Criteria, to be deemed "ready to proceed", all planning (including the selection of sites, wastewater/stormwater systems to be implemented, reclaimed water evaluation, and financing must be complete; sites must be established as available for the intended purposes, public participation must be documented; and a design/build/operate, design/build or a construction contract would have to be either executed or authorized for execution by the project sponsor's governing body

Further definition of theses criteria presented in this document include requirements in the areas of: project site identification and availability, engineering, planning documentation, financial planning, connection and pretreatment ordinances, user charge fees, and public participation. Additionally, the document discusses the idea that acceptance of any federal grant funds shall not be contingent upon the receipt of additional federal/state funds in subsequent appropriations. Finally, the document calls for Quarterly Progress Assessment Meetings and deadlines for establishing "Readiness to Proceed". The document can be found in Appendix C.

3.2.6 Revised Readiness to Proceed Criteria

A Revised Readiness to Proceed Criteria was drafted by a sub-committee of the Project Delivery Team and distributed for comment on December 6, 2002. The revised document includes the following major changes:

- The requirement for completed "financing" was changed to "financial planning"
- The requirement for a design/build/operate, design/build or a construction contract was changed to add the receipt of a bid would qualify
- A time limit for execution or authorization for execution of a contract was established at within six (6) months of availability of grant funds.
- The requirement for Environmental Assessments to be "completed" was changed to be "underway".
- The requirement for Environmental Assessment, as required, to be completed was stricken.
- The requirement that a treatment process be identified was stricken.
- The requirement for a "financial plan identifying the rates, fees, and charges associated with providing wastewater/stormwater management services" was changed to a "financial plan identifying the method of collecting rates,....." .
- The deadline for Readiness to Proceed was stricken.

Based on this revised Criteria, the point system presented below was develop in order to assess each projects readiness.

Table 3.2 Florida Keys Water Quality Improvement Program Readiness Assessment

	Assessment Criteria	Score If Satisfied
1	**Site**	**4**
A	Identification of Site	1
B	Environmental and Technical Suitability	1
C	Availability of Interest	1
D	Legal and Zoning Designations	1
2.1	**Engineering for WW Management Projects**	**3**
A	Plant Identification	1
B	Collection and Transmission System Identification	1
C	Overlay of Plant on Survey	1
2.2	**Engineering for SW Management Projects**	**3**
A	Treatment and Disposal Identification	1.5
B	Conveyance and Storage System Identification	1.5
3	**Planning Documentation**	**5**
A	Completion of Planning	2
B	**Financial Plan**	**3**
B.1	Financial Breakdown	1
B.2	Estimated Costs for WW/SW Management and Additional Work	1
B.3	Financial Commitments	1
4	**Legal**	**3**
A	Connection Ordinance for WW	1
B	Pretreatment Ordinance for WW	1
C	User Charge or Fee Provisions	1
5	**Public Participation**	**5**

	Assessment Criteria	Score If Satisfied
A	Selection of Project Sites	2
B	Establishment of Ordinances/Resolutions	1
C	Adoption of Recommendations for WW/SW Management Option and Reuse	1
D	Financial Planning	1

The total potential points for any project would be 20.

3.2.6.1 Distribution Formula Approved by the ITF

The ITF has developed the "Distribution Formula Approved by the Intergovernmental Task Force and Presented for Approval to the Various Municipal Governments of the Florida Keys" (Distribution Formula). This document is included in Appendix E.

The Distribution Formula documents the desired and agreed upon distribution of a $100 million Federal Appropriation. The agreed upon distribution includes the following points:

- ".... all priority project should participate in any funding that occurs until such time as their promised amounts of funding were reached, as long as all such prioritized project were considered 'ready to proceed' within the fiscal year in which the appropriation was made.."
- Readiness to proceed will be based on the "Readiness to Proceed" document developed by the ITF (Appendix C).

Five different funding scenarios were developed based on different funding levels that could be expected from the Federal Appropriation and various levels of "readiness to proceed" of different projects.

Once the appropriation is made or scheduled to be made, the ITF proposes to confer with its State "partners" to review the "readiness to proceed" status of each prioritized project. If the amount of funding is deemed too small to be divided according to scenarios stated above such that "substantial progress can be made", the ITF will meet to propose a project be funded for which it is presumed "substantial progress" can be made.

The PDT has agreed to utilize the Revised Readiness to Proceed Criteria (Appendix D) to assess a project's readiness to proceed as part of the FKWQIP.

3.3 Initial Projects

3.3.1 Selection Process

In developing the list of initial projects as a sub-set of the Master Project List, the following were considered:

- The Distribution Formula Approved by the ITF (Distribution Formula). Each local entity, as dictated in the Distribution Formula, is to receive a specified amount of the total funding. While this document does not specify the distribution for any funding greater than $30 million, the PDT and ITF has agreed to the following distribution of the $100 million in funding should it be appropriated:

    - City of Key West $10,300,000
    - City of Marathon $29,300,000
    - Village of Islamorada $29,300,000
    - Monroe County $29,300,000
    - City of Layton $ 1,582,250
    - City of Key Colony Beach $ 335,000

- As discussed above, should the appropriation be less than $100 million, the Distribution Formulas would be used as guidance in selecting which projects would be funded.

- For each of the entities which makeup the ITF, the highest priority projects from the Master Project List were selected for inclusion in the Initial Project List up to the amount of funding allocated for each entity.

3.3.2 Initial Project List

As with the PMP, the Initial Project List is a dynamic document, as some projects will become substantially closer to Ready to Proceed as the FKWQIP proceeds. Additionally, other sources of funding may become available such that high priority projects may be completed prior to distribution of funds from the FKWQIP.

The Initial Project List includes the name of the entity responsible for the project, the project name and type of project (wastewater or stormwater), whether or not the project is in a "Hot Spot" area, a readiness assessment ,and, the projected cost of the project as well as what FKWQIP funds would be allocated to the project, the local match funds required and the need for any additional funds. Detailed descriptions of the work involved in each of the projects can be found on the Master Project List ad the respective planning documents used to compile the Master Project List.

Table 3.3 Initial Projects

Entity	Project Priority	Project Name	Project Type SW/WW	Hot Spot Area?	Readiness (Out of 20)	Projected Cost	Potential Allowance from Federal Funding	Local Match
Key West	1	Stormwater Projects 1-89	SW		20	$ 15,964,567	$ 10,300,000	$ 5,664,567
Subtotal Key West						**$ 15,964,567**	**$ 10,300,000**	**$ 5,664,567**
Layton	1	Long Key Estates, City of Layton, area adjacent to US1	WW	Y	11	$ 4,650,000	$ 1,582,250	$ 3,067,750
Subtotal Layton						**$ 4,650,000**	**$ 1,582,250**	**$ 3,067,750**
Key Colony Beach	1	City of Key Colony Beach Sanitary Sewer Rehabilitation	WW		20	$ 335,000	$ 217,750	$ 117,250
Subtotal Key Colony Beach						**$ 335,000**	**$ 217,750**	**$ 117,250**
Marathon	1	Marathon I - Little Venice	WW	Y	20	$ 11,200,000		$ 11,200,000
	2	Conch Key	WW	Y	18	$ 2,600,000		$ 2,600,000
	3	Marathon II	WW	Y	20	$ 39,963,902	$ 25,976,536	$ 13,987,366
	4	Marathon III	WW	Y	20	$ 34,016,624	$ 3,323,464	$ 30,693,160
Subtotal Marathon						**$ 87,780,526**	**$ 29,300,000**	**$ 58,480,526**
Islamorada	1	Plantation Key Colony Phase I	WW	Y	20	$ 10,125,000		$ 10,125,000
	2	Plantation Key Colony Phase IA	WW	Y	20	$ 525,817	$ 341,781	$ 184,036
	3	Plantation Key Colony Phase II	WW	Y	20	$ 10,791,982	$ 7,014,788	$ 3,777,194
	4	Plantation Key	WW	Y	10	$ 41,599,546	$ 21,943,431	$ 19,656,115
Subtotal Islamorada						**$ 63,042,345**	**$ 29,300,000**	**$ 33,742,345**
Key Largo	1	PAED 19/20 - Tavernier KL Regional	WW	Y	20	$ 11,759,286		$ 11,759,286
	2	PAED 18 - KL Trailer Village, Ect	WW	Y	20	$ 8,400,000		$ 8,400,000
	3	PAED 18 - Cross Key Waterway Estates, Etc.	WW	Y	4	$ 10,369,553	$ 6,740,209	$ 3,629,344
	4	PAED 16 / Area A	WW	Y	4	$ 1,881,052	$ 1,881,052	
Subtotal Key Largo						**$ 32,409,891**	**$ 8,621,261**	**$ 23,788,630**
Monroe County	1	Stock Island - KWRU	WW	Y	20	$ 4,600,000		$ 4,600,000
	2	Boca Chica - Big Coppitt	WW	Y	14	$ 13,065,988	$ 8,492,892	$ 4,573,096
	3	Bay Point	WW	Y	15	$ 4,505,513	$ 2,928,584	$ 1,576,930
	4	Big Pine Regional - Whispering Pines	WW	Y	10	$ 12,390,161	$ 8,053,605	$ 4,336,556
	5	Big Pine Regional - Doctor's Arm	WW	Y	10	$ 7,321,459	$ 1,203,658	$ 6,117,801
Subtotal Monroe County						**$ 41,883,121**	**$ 20,678,739**	**$ 21,204,383**
Totals						**$ 246,065,450**	**$ 100,000,000**	**$ 146,065,450**